

## In-Flight and Pre-Flight Detection of Pitot Tube Anomalies, Phase II

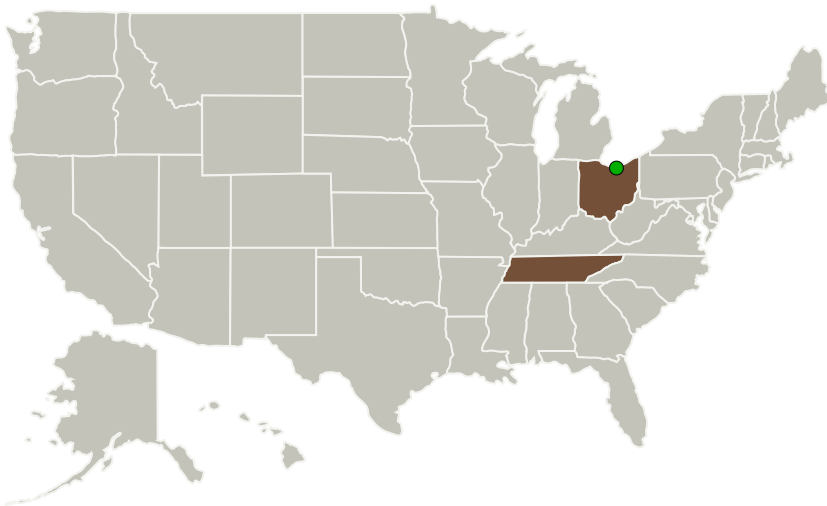
Completed Technology Project (2011 - 2013)



## Project Introduction

The health and integrity of aircraft sensors play a critical role in aviation safety. Unfortunately, inaccurate or false readings from these sensors can lead to improper decision-making resulting in serious and sometimes fatal consequences. The research performed in Phase I demonstrated the feasibility of using advanced data analysis techniques to identify anomalies in Pitot tubes resulting from blockage such as icing, moisture, or foreign objects. The core technology used in this project is referred to as "noise analysis" since it relates a sensor's response time to the dynamic component (noise) found in the signal of these same sensors. This analysis technique has used existing electrical signals of Pitot tube sensors that result from measured processes during in-flight conditions and/or induced signals in pre-flight conditions to detect anomalies in the sensor readings. AMS has routinely used this technology to determine the health of pressure transmitters in nuclear power plants. The application of this technology for the detection of aircraft anomalies is innovative in that instead of determining the health of process monitoring at a steady state condition, this technology will be used to quickly inform the pilot when an air speed indication becomes faulty under any flight condition as well as during pre-flight preparation.

## Primary U.S. Work Locations and Key Partners



In-Flight and Pre-Flight  
Detection of Pitot Tube  
Anomalies, Phase II

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Organizations Performing Work	Role	Type	Location
Analysis and Measurement Services Corporation	Lead Organization	Industry	Knoxville, Tennessee
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Ohio	Tennessee

## Project Transitions

**June 2011:** Project Start**November 2013:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138982>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Analysis and Measurement Services Corporation

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

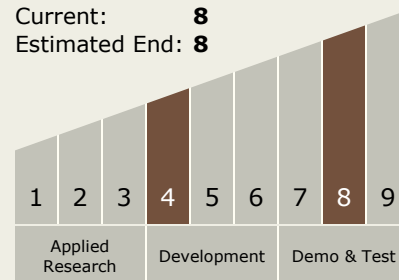
H. M Hashemian

## Technology Maturity (TRL)

Start: 4

Current: 8

Estimated End: 8



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### Technology Areas

#### Primary:

- TX01 Propulsion Systems
  - └ TX01.3 Aero Propulsion
    - └ TX01.3.11 Engine Icing

### Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System